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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/806,232
Filing Date: March 23, 2004
Appellant(s): BARTENBACH ET AL.

Michael P. Byrne
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 24 June 2008 appealing from the Office Action mailed 28 December 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. However, Examiner notes that claim 18 has not been rejected

under 35 U.S.C. 102(b) as anticipated by Gravley (US 4,765,964), but rather has been rejected under 35 U.S.C. 103(a) as obvious over Gravely (US 4,765,964) in view of Bakker (US 3,640,739) (see Office Action mailed 28 December 2007 at page 2, paragraph 7 and page 7, paragraph 28). Thus, the correct grounds for rejection to be reviewed on appeal should read, in relevant part:

"Whether the Office action erred in rejecting:

I. claims 1-13 and 20-22 under 35 U.S.C. §102(b) over US 4,765,964 to Gravley (hereinafter, "Gravley");

II. claim 23 under 35 U.S.C. §103(a) over Gravley in view of US 5,188,806 to Keuhner (hereinafter, "Kuehner"); and

III. claims 14—18 and 24 under 35 U.S.C. §103(a) over Gravley in view of US 3,640,739 to Bakker (hereinafter, "Bakker")."

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 4,765,964	GRAVLEY et al.	08-1988
US 5,188,806	KUEHNER et al.	02-1993
US 3,640,739	BAKKER et al.	02-1972

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-13 and 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Gravley et al. (Gravely, US 4,765,964).

3. With respect to claim 1, Gravley discloses a process for the scale-up of a reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber (column 3, lines 15-16), a high temperature reaction having a short residence time taking place in the reaction chamber (column 7, lines 56-60) and the reaction mixture subsequently being rapidly cooled in a quench area (column 6, lines 37-39), characterized in that for a throughput enlargement the internal diameter of the reactor is enlarged (see Table I, runs 8 and 9), the transition from the reaction chamber to the quench area being designed in the form of a gap (see Figure) which is restricted to a width in the range from 2 to 200 mm (column 6, lines 31-34, and column 10, line 39).

4. With respect to claim 2, Gravley discloses a transition of the reaction chamber to the quench area restricted to a gap having a width in the range from 50 to 150 mm (column 6, lines 31-34, and column 10, line 39).

5. With respect to claim 3, Gravley discloses a reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber (column 3, lines 15-16), a high temperature reaction having a short residence time taking place in the reaction chamber (column 7, lines 56-60) and the reaction mixture subsequently being rapidly cooled in a quench area (column 6, lines 37-39), characterized in that the transition of the reaction chamber to the quench area is designed in the form of an annular gap (see Figure).

6. With respect to claim 4, Gravley discloses an annular gap restricted to a width in the range from 2 to 200 mm (column 6, lines 31-34, and column 10, line 39).

7. With respect to claim 5, Gravley discloses a reaction chamber designed in the form of an annular gap (see Figure).

8. With respect to claims 6 and 7, Gravley discloses channels of the burner block aligned in the longitudinal axis of the reaction chamber (23).

9. With respect to claim 8, Gravley discloses the quench area constructed aligned in the direction of the longitudinal axis of the reaction chamber (see Figure).

10. With respect to claim 9, Gravley discloses rapid cooling of the reaction mixture in the quench area brought about by direct or indirect quenching (column 6, lines 37-39).

11. With respect to claim 10, Gravley discloses direct quenching brought about by single or multistage mixing of a cooling medium into the reaction mixture (column 6, lines 37-56).

12. With respect to claims 11, Gravley discloses direct quenching brought about by direct mixing of cooling medium into the quench area designed like an annular gap from outside (see Figure).

13. With respect to claim 12, Gravley discloses direct quenching brought about by introducing a cooling medium via quench nozzles arranged radially or tangentially to the main flow direction of the reaction mixture in the reactor (see Figure).

14. With respect to claim 13, Gravley discloses wherein all surfaces restricting the reaction chamber are formed of a fire-resistant ceramic having an alumina content of at least 80% by weight (column 5, lines 49-53).

15. With respect to claim 20, Gravley discloses wherein the annular gap is restricted to a width in the range from 50 to 150 mm (column 6, lines 31-34, and column 10, line 39).

16. With respect to claim 21, Gravley discloses wherein a quench area is constructed as a gap (see Figure).

17. With respect to claim 22, Gravley discloses wherein the gap has an annular shape (see Figure).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gravley et al. (Gravely, US 4,765,964). Alternatively, claim 23 is rejected under 35 U.S.C.

103(a) as being unpatentable over Gravley et al. (Gravely, US 4,765,964) in view of Kuehner et al. (Kuehner, US 5,188,806).

22. With respect to claim 23, Gravley discloses a reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber (column 3, lines 15-16), a high temperature reaction having a short residence time taking place in the reaction chamber (column 7, lines 56-60) and the reaction mixture subsequently being rapidly cooled in a quench area (column 6, lines 37-39), characterized in that the transition of the reaction chamber to the quench area is designed in the form of an annular gap (see Figure); an annular gap restricted to a width in the range from 2 to 200 mm (column 6, lines 31-34, and column 10, line 39); and direct quenching brought about by single or multistage mixing of a cooling medium into the reaction mixture (column 6, lines 37-56).

Gravley does not disclose direct quenching brought about by single or multistage mixing of a cooling medium into the reaction mixture via one or more annular distributors.

However, direct quenching via annular distributors is known in the art (see e.g., Kuehner (US 5188806), column 3, lines 66-68, and column 4, lines 1-7).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to provide direct quenching of the reaction mixture by means of an annular distributor.

23. Claims 14-18 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gravley et al. (Gravely, US 4,765,964) in view of Bakker et al. (Bakker, US 3,640,739).

24. With respect to claims 14 and 15, Gravley discloses a reactor having a supply of a reaction mixture via channels of a burner block to a reaction chamber (see Gravley, column 3, lines 15-16), a high temperature reaction having a short residence time taking place in the reaction chamber (see Gravley, column 7, lines 56-60) and the reaction mixture subsequently being rapidly cooled in a quench area (see Gravley, column 6, lines 37-39), characterized in that the transition of the reaction chamber to the quench area is designed in the form of an annular gap (see Gravley, Figure).

Gravley does not disclose a reactor characterized in that the alumina content of the fire-resistant ceramic is at least 95% by weight.

However, Bakker discloses a refractory material made from a high purity alumina refractory brick batch mix consisting of 85% – 95% alumina by weight (see Bakker, column 2, lines 10-12). Bakker discloses that the refractories of his invention are of increased strength, higher density, lower porosity, and higher refractoriness than other refractories commercially available (see Bakker, column 1, lines 62-67).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to incorporate the refractory of Bakker into the reactor of Gravley so as to provide for a more durable refractory sufficient for use under high reaction temperatures.

25. With respect to claims 16 and 17, Bakker discloses a fire-resistant ceramic shaped into bricks, compressed, dried, and calcined (see Bakker, column 3, lines 58-70).

26. With respect to claims 18 and 24, Bakker discloses pressing the refractory mix into any desired shape (see Bakker, column 3, lines 58-59).

(10) Response to Argument

Appellant's argument on page 4

Appellant argues on page 4 of the brief that the term "gap" as recited in independent claims 1 and 3 is expressly defined by illustration in the figures.

Examiner finds Appellant's argument unpersuasive inasmuch as the court has specifically held that it is improper to read limitations from a preferred embodiment described in the specification into the claims absent a clear indication that the patentee intended the claims to be so limited. *See* *Liebel-Flarsheim Co. v. Medrad Inc.*, 69 USPQ.2d 1801, 1807, 1813 (Fed. Cir. 2004) ("[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."). Moreover, the court has instructed that ordinary, simple English words (e.g., "gap," "channels," etc.) whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say. *See* MPEP § 2111.01 (citing *Chef America, Inc. v. Lamb-Weston, Inc.*, 69 USPQ.2d 1857

(Fed. Cir. 2004)). In this regard, Examiner notes that the words of a claim are generally *not* limited to what is shown or disclosed in the specification. *See id* (citing *Liebel-Flarsheim Co. v. Medrad Inc.*, 69 USPQ.2d 1801, 1807 (Fed. Cir. 2004)).

Thus, Examiner construes Appellant's "gap" to be synonymous with "a break or opening" or "an empty space or interval" designed in the form of an annulus. In the context of Appellant's claim 1, such gap need only be 2 mm (i.e., 0.2 cm or 0.002 m) to satisfy the limitation.

Appellant's arguments on pages 6 and 7

Appellant argues on pages 6 and 7 of the brief: (a) that the transition from Gravley's combustion zone (4) to the mixing zone (6) cannot properly be characterized as a transition from a reaction chamber to a quench area; (b) that the transition from Gravely's mixing zone (6) to the pyrolysis zone (8) cannot properly be characterized as a transition from a reaction chamber to a quench area; and (c) that the only conceivable transition from a reaction chamber to a quench area in Gravley is within the pyrolysis zone (8).

In response to Appellant's arguments, Examiner notes that the three zones of Gravely's reactor cited by Appellant (i.e., "combustion zone" (4), "mixing zone" (6), and "pyrolysis zone" (8)) include two separate "reaction zones." Thus, a combustion reaction takes place in the "combustion zone" (4) of Gravley while a pyrolysis reaction takes place in the "combustion zone" (4) and/or "pyrolysis zone" (8) of Gravley.[1]

The relevant portion of Appellant's claim 1 reads, in relevant part: *". . . the transition from the reaction chamber to the quench area being designed in the form of an annular gap which is restricted to a width in the range from 2 to 200 mm."* With reference to Gravley's sole drawing, Examiner notes that the "quench area" of Gravley can be found in the pyrolysis zone (8) wherein quench fluid is injected into the pyrolysis zone (8) by way of spray nozzle assembly (60) (see Gravley, column 6, lines 37-43). Taking the combustion zone (4) of Gravley to be the "the reaction chamber,"[1] Examiner submits that an "annular gap" (of at least 2 mm) would be found in the area of the downstream end of axial feedstock injector assembly (42) wherein the inner region of such gap would be formed by the distal end of the injector assembly (42) itself with the outer region of such gap being formed by the converging combustion chamber (32).

Thus, Examiner maintains that Gravley discloses an "annular gap" of at least 2 mm in the transition from the reaction chamber to the quench area.

Appellant's argument on pages 7 and 8

Appellant argues on pages 7 and 8 of the brief that Examiner's equating of Gravley's annularly shaped end wall (46) with an "annular gap" constitutes clear error.

In response to Appellant's argument, Examiner submits that he has never made statements to the effect that Gravley's annularly shaped end wall (46) constitutes or is

[1] Examiner notes that Gravley discloses the possibility of injecting liquid carbonaceous feedstock (source of the pyrolysis reaction) into the converging chamber (32) via feedstock injectors (40). Thus, under this mode of operation, the "combustion zone" would be expected to house two simultaneous reactions – (1) the combustion of combustible fluid (e.g., methane) introduced via passage (16); and (2) the pyrolytic decomposition of liquid carbonaceous feedstock introduced via feedstock injectors (40). Both of these

otherwise an equivalent of an "annular gap." Appellant's argument is based on various of Examiner's statements found in the Advisory Action mailed 2 April 2008. However, Examiner was merely noting portions of Gravley's disclosure wherein Gravley makes eleven separate references to various of his reactor components as having annular shape or geometry (see Examiner's comments in the Advisory Action mailed 2 April 2008) (citing Gravley at column 1, lines 60-61; column 2, lines 1-2; column 3, lines 9-10, 31, 42, and 52-53; column 5, lines 7 and 64; column 10, lines 52-54; and column 29, lines 21-23). However, as also noted in the Advisory Action and entirely consistent with Examiner's analysis and position as set forth, *supra*, "[A]n additional annular gap can be seen in the drawing of Gravley being formed by the converging chamber 32 with feedstock injector assembly 42 protruding therethrough, and thereby creating a transition area in the form of an 'annular gap.'" (see Examiner's comments in the Advisory Action mailed 2 April 2008).

In summary, Examiner does <u>not</u> interpret Gravley's annular end wall (46) to be an "annular gap." Appellant's argument to such effect is a mischaracterization of Examiner's position as set forth in the Advisory Action mailed 2 April 2008 and pages 11 and 12, *supra*.

<u>Appellant's argument on page 9</u>

Appellant argues on page 9 of the brief that the Gravley reactor does not provide a supply of a reaction mixture via channels of a burner block.

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reactions take place upstream from the "quench area" located generally in the area of spray nozzle

In response to Appellant's argument, Examiner notes that Appellant has defined the claims broadly and has provided no special definition for either "channel" or "gap." Consequently, Examiner interprets "channel" to be synonymous with "passage," and "gap" to be synonymous with "a break or opening" or "an empty space or interval." Appellant's reliance on Figure 3 of Appellant's specification to purportedly define what is meant by "channels" is unpersuasive inasmuch as the court has specifically held that it is improper to read limitations from a preferred embodiment described in the specification into the claims absent a clear indication that the patentee intended the claims to be so limited. *See* *Liebel-Flarsheim Co. v. Medrad Inc.*, 69 USPQ.2d 1801, 1807, 1813 (Fed. Cir. 2004) ("[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."). Moreover, the court has instructed that ordinary, simple English words (e.g., "gap," "channels," etc.) whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their meaning, are construed to mean exactly what they say. *See* MPEP § 2111.01 (citing *Chef America, Inc. v. Lamb-Weston, Inc.*, 69 USPQ.2d 1857 (Fed. Cir. 2004)). In this regard, Examiner notes that the words of a claim are generally *not* limited to what is shown or disclosed in the specification. *See* *id* (citing *Liebel-Flarsheim Co. v. Medrad Inc.*, 69 USPQ.2d 1801, 1807 (Fed. Cir. 2004)).

Finally, Examiner notes that the relevant portion of Appellant's claim 1 reads, in relevant part: *" . . . a reactor having a supply of a reaction mixture via channels of a*

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assembly (60) for injection of quench fluid into the pyrolysis zone (8).

burner block . . .". In this regard, Gravley discloses a reaction mixture (i.e., oxidant fluid and combustible fluid (e.g., methane)) being introduced into the combustion chamber (10) via passage (16) which leads from upstream passage (18) and wherein the combustible fluid is delivered through a plurality of radially outwardly directed ports or orifices (30) passing through the sidewall of tubular member (23) (see Gravley, column 3, lines 15-58; and drawing). Thus, Examiner submits that Gravley discloses "supply of a reaction mixture via channels of a burner block."

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Randy P. Boyer

/Randy P. Boyer/

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